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Transportation and access to urban services in Dar es Salaam

Transport et accès aux équipements à Dar es Salaam

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ABSTRACT. Transportation in Dar es Salaam is particularly difficult. Statistical data drawn from the 1993 Human Resources Development Survey confirm that in unplanned wards, transportation conditions and access to urban services are less favourable than in the rest of the city. The poverty of a majority of city inhabitants, the low quality of urban passenger transport and poor accessibility result in daily mobility reduced to the immediate neighbourhood, which in turn tends to perpetuate poverty.

RESUMÉ. Les conditions de transport sont particulièrement difficiles à Dar es Salaam. Les résultats de l'enquête HRDS 1993 confirment le fait que dans les quartiers non lotis, les conditions de transport et l'accès aux équipements et services urbains sont moins favorables que dans le reste de la ville. La majorité des habitants ayant des revenus faibles, le niveau de l'offre urbain et la mauvaise accessibilité les contraignent à une mobilité réduite de proximité qui à son tour entretient des situations de pauvreté.

1 INTRODUCTION

The gap between transportation needs and the means to satisfy those needs would appear very great in Dar es Salaam today. In one of the poorest countries in Africa, the main city is confronted with tremendous population growth accompanied by rapid and unorganised urban sprawl with a split between residential zones on the one hand and zones for employment, trade, health services, etc. on the other. In a general context of poverty (the inhabitants as well as local and national finances), the failure of the period of "bottom-up socialism" paved the way to a form of "bottom-up deregulation", in which private players and companies, consumers and associations are encouraged to replace the public authorities unable to supply necessary services, with very mixed results for the time being. In terms of transportation, this extremely rapid deregulation resulted in virtual elimination of the urban public transport company UDA and the development of private companies, generally in the form of small companies, but occasionally speculative as well. The *daladalas*, variously sized minibuses and buses, now provide virtually all urban passenger transport and, in the absence of a regulation agency, tend to focus on the most profitable lines as well as on the most profitable clienteles (there are uncountable examples of uniformed school children, who pay a lower fare,

being refused at rush hour in favour of more profitable clients) (Plat & Pochet, 2002). Thus, in spite of the vitality and the great number of informal transport operators, the current system has great difficulty in covering the increase in both population and surface area and in meeting the basic needs of its inhabitants, particularly the poorest.

2 SPATIAL SEPARATION BETWEEN RESIDENTIAL AND EMPLOYMENT ZONES

According to census data, the population of Dar es Salaam was 348 000 in 1968, 852 000 in 1978 (i.e. an annual growth rate of 9.4%) and 1 345 000 in 1988 (i.e. an annual growth rate of 4.7% since 1978). Population growth has not slowed over the last few years and the current number of inhabitants may be estimated at 2.5 to 3 million. This high growth, virtually uncontrolled by the local authorities, has resulted in a division, both functional and spatial, of the city, with spectacular growth of urbanised zones in a fan-like pattern (Banyikwa, 1988), initially along the major roads, then by filling in the zones in between. The surface area of the city was multiplied by a factor of five from 1968 to 1982 (Maunder & Fouracre, 1987). The maximum distance from centre to fringe, only 6 to 10 kilometres in 1969, rose to 15 km in 1978 and then

to 30 km in the middle of the 1990s (Kombe, 1994). The great majority of the population lives within 10 km of the centre, but that nonetheless constitutes a considerable distance given the structure of the existing road network. The peripheral areas are generally made up of informal settlements and urbanisation is increasingly unplanned (see Map 1).

This spatial dispersion causes all the more problems that jobs and the main urban services are highly concentrated in the Central Business District (CBD) or nearby. The main commercial district (Kariakoo), the largest market, the main hospital (Muhimbili), the industrial zone and the port are all close to the centre (see Map 2). Even though the concentration of economic and employment zones in a limited area is, of course, not total, Dar es Salaam is characterised by a high level of spatial specialisation and the separation of residential and employment zones.

Given the geographic situation, the structure of the city and the location of jobs and homes, the distance that must be covered on a daily basis to go to work (or to school or the university) is often 20 km round trip. In the middle of the 1980s, the average one-way trip using public transportation was already approximately 8 km (Maunder & Fouracre, 1987) and that distance has certainly increased since, in step with the urban sprawl. The high numbers of people walking along the major roads in non-urbanised areas shows that trips on foot over several kilometres are frequent in Dar es Salaam.

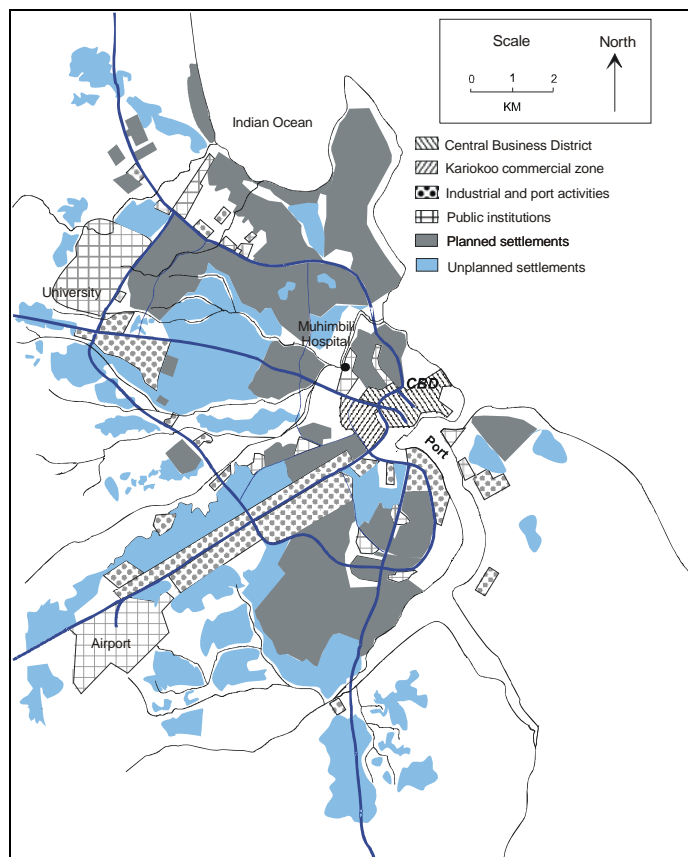


Figure 1. Residential and employment zones and main services.

Travel is just as difficult within the neighbourhoods as well. Local roads, rarely paved, make for uncertain travel by four-wheel vehicles and the minibuses must weave between ruts at a very low speed. Non-motorised travel is also difficult and occasionally dangerous due to the absence of sidewalks and reserved lanes, as well as the clogging of streets by shops and even unauthorised dumps. Conditions can even become impossible during the rainy season, when the increasing number and depth of holes can completely block vehicles. The very few motorised persons simply leave their vehicle at the entry of the neighbourhood, taxis demand double fare or simply refuse to enter, goods must be transported using carts, etc. Daily trips on foot are also made much more complex by the rains in that people can be cut off in their neighbourhood by the collapse of road bridges or rail bridges, as in Tabata in 1998. They are then obliged to cross flooded rivers (sometimes at great risk) or simply not know where to go through the flooded streets.

These access problems, noted even in the richest residential areas (occasionally called *modern slums* for this reason), are particularly serious in the unplanned residential areas (*squatter settlements*). They reveal a larger planning problem, i.e. most often, access roads were not planned from the start.

This double nature of roads (highly radial structure of the fairly well maintained main roads and increasingly poor secondary roads) has over the past few years caused even more severe problems

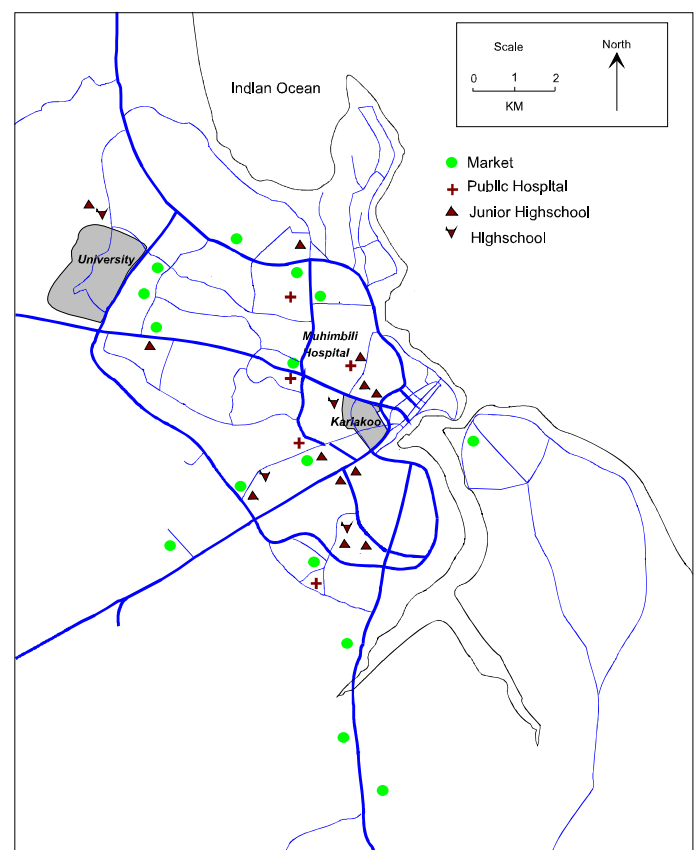


Figure 2. Location of various urban services.

concerning the interconnection between residential areas and increasing differences in the quality of access to the centre, which depends on their distance to the centre and, even more important, on the distance to paved roads and public transportation.

3 VARYING ACCESS CONDITIONS IN THE CITY

The Human Resources Development (HRD) Survey, carried out in 1993, provides the data required to assess the structural difficulties of Dar es Salaam residents and in particular to reveal the unequal conditions between inhabited areas by distinguishing the different types of residential zones, i.e. planned and unplanned wards. Among the first, we also distinguished the affluent wards where Western-style houses are numerous. This survey was carried out by the Department of Economics of the University of Dar es Salaam, the Government of Tanzania and the World Bank, and was funded by the World Bank, the Government of Japan and the British Overseas Development Agency. It includes a sub-sample of 1 128 households representing the population of Dar es Salaam.

The closest road is, on average, 300 metres from the home and provides passenger transportation in only two cases out of three. This distance to the closest road varies by a factor of up to two between unplanned and affluent wards. Though the average distance may not seem very great, situations are very different within each type of ward. Some homes are very close to a road, others are over a kilometre distant. Given the large distances between stops on the *daladalas* lines, the closest stop is often 1 to 2 km from the home, which means 15 to 30-minute walks and a considerable increase in both daily travel times and inconvenience.

The quality of roads also varies. In unplanned wards, access roads sized for four-wheel motor vehicles are paved for only 46% of homes, as compared to 55% in planned wards and 60% in affluent wards. Access to public transport is satisfactory in planned wards (77% of homes) and is paradoxically similar in the unplanned (62%) and the affluent wards (64%). The situation in the latter group may be explained by the reduced demand for public transport on the part of people with personal cars. Consequently, the situation for the least rich people in these areas and for those who work there is just as poor as in the unplanned wards.

This unequal access to the transportation networks is all the more critical that it is combined with a more or less pronounced lack of services in the various areas.

The generally recent extension of the unplanned settlements and their poor connections with the road network are without doubt the cause of the greater

distance to the main schools and health services. The most affluent wards would appear to be the best equipped with these two types of public services, the contrary being true for the unplanned wards. Only the primary schools (see Table 1) and the community clinics (see Table 2), basic local services, would appear to be as numerous in the unplanned wards as in the rest of the city. These results are confirmed by the shorter distance covered by school children in the unplanned wards. For children from poorer families, this shorter distance is certainly due to both the end of schooling at a younger age and the difficulty of attending private schools. As a result, in the unplanned zones, children are more likely to go to the public primary schools, closer to the home, than children in the planned ones. Furthermore, over the past few years, the gap between rich and poor has increased due to the significant drop in attendance in primary schools for children from poor families (Lugalla, 1997).

Table 1. Proximity of home to schools, depending on the type of ward, in kilometres.

	unplanned	planned	affluent
Public primary school	1.1	0.8	0.8
Private primary school	6.7	5.6	3.8
Public secondary school	5.7	4.5	3.4
Private secondary school	3.7	3.0	3.1
Distance for school children	1.7	1.8	2.4

Source: HRD Survey in 1993.

Table 2. Proximity of home to health services, depending on the type of ward, in kilometres.

	unplanned	planned	affluent
Public clinic	2.3	2.6	1.7
Private clinic	1.0	1.3	0.9
Public hospital	4.7	3.2	2.9
Private hospital	6.3	4.9	4.4

Source: HRD Survey in 1993.

A study on the health services revealed that over 50% of the people going to private establishments used motorised transportation, primarily the *daladalas*, as compared to 12% on average for the public establishments covered in the study (Zambrano Gil, 1994). The use of transportation other than on foot signifies a much wider choice of medical establishments and would seem to be beyond the means of poor families. In addition to the costs, already dissuasive, of the health care, the cost and inconvenience of travel to and from the establishment also reduce the use of hospital services. Similar limitations are also prevalent for the purchase of food by families.

The distance to markets constitutes a daily handicap because the price of products is higher in small local stores, as noted by De Langen (1994). The HRD Survey confirms that for food purchases, stores are slightly closer for residents in the unplanned wards (see Table 3). The fact that people

go to small local stores is probably not because they choose to do so, but is rather due to the lack of nearby markets. Almost all the large sites to purchase food are near the main roads. Concerning markets in the wards, similar to the other services, they tend to be more numerous in the older wards.

Table 3. Food purchases depending on the type of ward.

Place of purchase (%)	unplanned	planned	affluent
Market	65	68	77
Store in the ward	33	30	23
Store outside the ward	1	1	0
Purchase from neighbours	1	0	0
Distance to place	450	630	660
Time (1-way, in minutes)	8	11	10
% of travel on foot	100	95	89

Source: HRD Survey in 1993.

The daily impositions inflicted on the poorest families due to the lack of infrastructure or more difficult access to basic services are made even more brutally clear when the question of water is analysed (see Table 4). Limited access to water is a problem for many households because, whatever the type of ward, almost one third of all people declare that, during a normal day, they must travel to obtain water (38% in the unplanned wards, 32% in the planned wards and 23% in the richer wards). In almost three families households out of four, this task is carried out by the women. Living in a home without running water, by far the most common situation in the unplanned areas, results in major inconveniences in daily life which are worsened by the relative scarcity of fountains and other water sources in those areas. For over one woman (or young girl) out of two and one man out of five in the unplanned zones, obtaining water in the unplanned wards takes on average almost one hour per day. Not only is the percentage of the concerned people in these wards much higher, the difficulty is also greater and water consumption is limited to the essential needs. When the distance to a source or the difficulty is too great, people may use the services of water vendors. This is the case for almost one household out of five in the unplanned wards, but it also increases the cost of access to water.

Table 4. Access to water depending on the type of ward.

	unplanned	planned	affluent
Homes with running water (%)	12	36	76
Purchase from vendors (%)	18	12	3
Distance to water for homes without (in metres)	280	120	20
Time to obtain water per home (in minutes)	59	34	20

Source: HRD Survey in 1993.

Access problems are therefore cumulative. Lack of accessibility and services in wards go hand in hand. The consequences are double. First, daily travel is longer and more difficult, secondly, costs are higher for the indispensable acts of daily life. For

example, the use of two *daladalas* to go to work, purchase of small (and more costly) quantities of food. Consequently, the cost of travel is dissuasive for families who often have very low revenues.

4 DECREASING SOLVENT DEMAND FOR TRANSPORTATION

Even though recent and precise data are not available, the various sources of information on hand reveal limited daily mobility. For example, in the middle of the 1980s, Maunder and Fouracre (1987) estimated, on the basis of a survey on 126 households in six zones of the city, that the average mobility was 1.5 trips per person per day, all age groups included. More recently, the smaller survey carried out in 1993 in the Temeke ward, though not representative of the entire city, produced relatively similar figures. Mobility was evaluated at 1.9 trips per day (De Langen, 1997a, 1997b), but this figure concerned only people 14 and older, who are more mobile than young children.

Though the surveys comprise some uncertainties, both studies nonetheless produce relatively close figures for the number of mechanised trips, whether on the overall level (approximately one mechanised trip per person on weekdays) or, more specifically, for trips using public transport (0.8 daily trips). Assessments made on the basis of data on expenditure for public transport, collected for the HRD Survey, show that the level of mobility using public transport is highly plausible. On the other hand, the data produced divergent results concerning trips on foot, 0.9 trips for the Temeke study as compared to 0.4 trips in the 1987 study, however, the latter figure is probably underestimated.

The above data, showing approximately one mechanised trip per person and per day, indicates the very low numbers of trips outside the zone of residence. Given that the same means of transportation is generally used both from the home and back, and that the minority of persons having a car has a very high level of mobility, thus increasing the overall average, it may be reasonably estimated that a major part of the inhabitants of Dar es Salaam does not use any form of motorised transportation during an ordinary week day. Though comparisons in this field are rather delicate due to differences in the survey methods, the available data shows that this low number of motorised trips is not unique in Africa. For example, the number of mechanised trips per person and per day was 1.2 in Bamako in 1993 and 1.4 in Niamey in 1996 (Diaz Olvera et al., 2000). However, what makes this low level particularly important in Dar es Salaam is the size of the city, much larger than these capital cities of West Africa. This factor makes trips on foot longer and

more difficult when travelling from one neighbourhood to another.

It should be noted as well that these average mobility levels cover a very wide range of values. Everything points to the conclusion that, in a context of low revenues and given the cultural system in which women are largely excluded from the workforce in Tanzania (Omari, 1994; Rwebangira, 1996), the decisions concerning trips are not in the favour of women or of the other unemployed inhabitants. Though the crisis may have encouraged the access of women to employment (Messkoub, 1996), in general the jobs remain poorly paid (O'Riordan, 1996) and thus less likely to justify access to mechanised means of transportation.

These difficulties concerning transportation therefore crystallise and reinforce differences in social status not only between households, but also within households, similar to what has been observed in other African cities (Diaz Olvera et al., 1999).

Though reduced, this mobility nonetheless weighs heavily on family budgets. The expenditure devoted by households to the daily trips of their members may be assessed on the basis of a number of different studies. According to the HRD Survey (see Table 4), transportation expenditure represented, on average in 1993, almost 10% of the overall budget, and thus constituted the third largest item in household budgets, though still far behind food (over 50% of total expenditure) and housing (over 20%). This figure of 10%, relatively low all things considered, is certainly due to the method of data collection in this type of study which underestimates transportation expenditure (Diaz Olvera et al., 2001). An older assessment produced the figure of 16% of total revenues allocated to public transport in 1985 (Maunder, Fouracre, 1987) and this percentage would not seem to have decreased since. Given the combined effects of the deregulation of rates and the drop in the purchasing power of households, the price of a daily round trip in a *daladala* has been calculated to have risen from 9% of the average daily wage in 1978 to 22% in 1998 (Tembele et al., 1998). In the HRD Survey, two thirds of transportation expenditure were devoted to public transport. This figure reflects the fact that owning a motor vehicle is hardly affordable for the large majority of Dar es Salaam inhabitants because of both high purchase and operating costs. Only one household in thirty declared expenses for gasoline, thus confirming that the possession and use of a car or motorised two-wheel vehicle remain very marginal phenomena.

The differences are highlighted even more clearly when the transportation expenditure is analysed in terms of the type of ward or levels of revenue. Expenditure is low in unplanned wards, average in planned wards and rises sharply in the affluent ones,

where the percentage of households owning a motor vehicle is higher (see Table 5).

In these affluent wards, travel expenditure is four times higher than in the unplanned ones. This difference between zones is even more striking when analysed in terms of revenue, comparing the 20% of families with the lowest income (first quintile) and the 20% of families with the highest income (fifth quintile). In the first four quintiles (80% of the households), public transport is dominant, whereas the fifth quintile has greater access to personal vehicles and spends 15 times as much as the average expenditure of the first quintile. It is true that the average revenue of the richest households (fifth quintile) is twice as high as that of the fourth and almost six times as high as that of the first quintile.

Table 5. Breakdown of annual family budget according to the type of ward.

	unplanned	planned	affluent
Annual expenditure (in Tsh '000, 1993)	799	1060	1554
Breakdown (%)			
Food	53,1	51,1	47,3
Housing	23,7	22,2	20,7
Transportation	6,3	8,0	13,3
Clothing	4,5	5,0	4,5
Health	2,7	2,7	1,9
School (w/o transportation)	0,7	1,0	1,4
Free time, miscellaneous	6,7	7,3	7,8
Transfers	2,4	2,7	3,2
Total	100,0	100,0	100,0

Source: HRD Survey in 1993.

The relatively low level of expenditure for public transportation on the part of the poorest households must of course be analysed in terms of the major constraints weighing on their daily budget, in which 80% of expenditures go toward food and housing. For the 40% of families with the lowest income (first two quintiles), once the costs of food and housing have been deducted, the average family has only 450 Tsh left per workday to cover all the other needs of the four family members (health, education, transportation, other purchases) and the 20% of families with the lowest income (first quintile) have only 250 Tsh. At the time of the survey, a round trip in a *daladala* cost at least 140 Tsh for the most simple and straightforward destinations. It would seem clear that the use of public transport was reserved for only the most indispensable trips. Households belonging to the 60% of families with the highest income (third, fourth and fifth quintiles) spend more on public transport if they live in a planned ward and not in an unplanned one, probably due to the proximity of paved roads offering more transportation opportunities, but above all because of the social composition of residential areas, as was shown by Banyikwa (1988). Employees in the public and semi-public sector are relatively numerous in the planned and the affluent wards,

whereas there are many more unemployed persons and people working in the informal sector living in the unplanned wards. Public employment, fairly concentrated in the city, makes the use of a motorised means of transportation a necessity when the person does not live in the immediate vicinity of the CBD. Civil servants and employees in the official private sector receive a bonus for their transportation costs, however it is far from sufficient to cover their real costs. Conversely, the people working in the informal sector are far more numerous among those working in their own neighbourhood or a place relatively easily accessible on foot from their home. What is more, the random nature of their revenues means they are more often obliged to walk to their workplace even if it is located at some distance from their home (street sellers, hawkers and other menial jobs).

The costs of transportation are therefore not negligible, particularly since the fare increased from Tsh 100 to Tsh 150 at the end of 1996 (with the exception of uniformed school children who pay Tsh 50). However, since the increase, the small-scale operators have had continuous problems in enforcing the new rate. During off-peak periods and over the weekends, when it is more difficult to fill the buses or for short trips, the price can drop back to Tsh 100. This effective resistance to the new fare may be considered an indicator of the daily financial difficulties encountered by households. The major limitations weighing on revenues would lead to the conclusion that the rise in rates at the end of 1996 resulted in a significant decrease in the solvent demand for transportation.

5 UNPLANNED SETTLEMENTS: A POVERTY TRAP?

The poor, unplanned settlements, difficult to access, represent an increasingly large percentage of urban Dar es Salaam as a whole, because they are supplied with a strong and regular flow of migrant population. In a context where the economy is becoming increasingly dual and the gaps between social classes are widening, the major deficiencies in the transportation system reinforce urban segregation. Existing transportation services and infrastructure succeed poorly in removing the many physical barriers and as a result, there are today numerous obstacles to the daily travel of the inhabitants of Dar es Salaam. These obstacles weigh heavily on schedules, complicate access to services ever further, limit the use of urban space and place major pressure on the budgets of households.

However, transportation certainly appears, in the eyes of the inhabitants, as just another of the daily problems and probably not among the most pressing, in comparison with the priority needs such as

housing, employment, access to water or how to pay the medical and school bills. The absence of demands on the part of the users of the passenger transportation system may certainly be explained by a certain fatalism and the long-standing habit of making do on a daily basis under difficult conditions. This situation is shown by their resignation during police raids that temporarily shut down a large number of illegal *daladalas* and force people to walk even greater distances.

These malfunctions nonetheless weigh heavily on the operation of the entire city, well beyond the simple transportation aspects. The result is that the poor households (the vast majority) must limit their trips outside the neighbourhood to the most indispensable activities.

This tendency to retreat into the area where the home is located is, of course, not specific to Dar es Salaam. It has been observed in the large peripheral zones of Bamako (Gibbal, 1988) and Niamey (Diaz Olvera et al., 2000), and can, in many cases, correspond to a major effort on the part of the residents to "put down roots" and to the desire to recreate a "*village in the city*", according to the term used by Gibbal. This tendency is not, however, without risks. On the one hand, these precarious "villages" and residential zones are rapidly caught up in the problems caused by their progressive and unplanned concentration of population which, in the end, reinforces the fragility of their living conditions. On the other, a retreat into the neighbourhood negates most solutions to alleviate poverty for the vast majority.

On the job market, transportation difficulties reduce even further the possibilities of finding an accessible job. What is more, for trips to and from work, long travel times in public transport or the difficulty of travel on foot over large distances can reduce the productivity of workers, notably for the poor workers.

In terms of living conditions, the availability and cost of public transport weigh heavily on the situation in other essential fields such as health and education in that they tend to reduce access to these services. For example, concerning attendance in secondary schools, the limited number of schools means that it is often necessary to use public transport given the chronic shortage or the unsuitability of alternate means, such as bicycles. Above and beyond the difficulty of transportation, particularly for school children, the simple cost of trips, even given the reduced fare, increases the overall cost of schooling and may constitute one of the factors resulting in the premature exit from school for children in poor families.

Finally, in terms of urban citizenship in general, the retreat into the neighbourhood can encourage a more lively local social life. However, it also forms the backdrop for more traditional lifestyles

(seclusion of women or travel of women restrained to the immediate vicinity, limited education for children, self-consumption) that do not develop broader social contacts and an alleviation of poverty.

Again, these tendencies are not specific to Dar es Salaam, indeed, they are currently underway in all the large African cities. But in the Tanzanian city, a number of factors have combined to increase the effects. Above and beyond geographical specificities and the size of the city, the long-standing lack of interest in urban planning and in the organisation of urban passenger transport in particular, as well as, more recently, the low collection rate of local taxes are negative factors in efforts to control urbanisation by the local authorities (Raison, 1994, Banyikwa, 1988).

It may be said that the context of rapid deregulation since the middle of the 1980s resulted in a quantitative increase in the supply of informal transportation. It also produced, in the residential zones, the emergence of micro-projects and local initiatives (for example, the repair of streets, largely financed by the inhabitants themselves), in the framework of a new type of entity, the "Community Based Organisation".

However, the economic deregulation and the inactivity of the local authorities also produced a significant increase in the social and spatial inequality within the city. Similar to the *daladalas* which, given the absence of a minimal amount of regulation for their activity, concentrate their routes on the few radial roads, the local initiatives to improve accessibility within the neighbourhoods depend too heavily on funding by the users themselves to be of any use in the poorest areas. To ensure a minimum degree of equity throughout the city as a whole, the public authorities must imperatively reassume a role in improving access throughout the city (specially for workers, school children and students), as well as the availability of basic local services (particularly for women), two interdependent aspects of public policy to alleviate poverty.

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